

Section 1 General Comments¹

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Issue A: EPA's standard unnecessarily duplicates NRC's implementation role.

1. [T]he duplication of the NRC role that EPA proposes in the implementation criteria in the draft standard is unnecessary and counter-productive. NRC can do a much better job of implementing any standard EPA prepares and promulgates if they are left to their own devices in

determining how to implement. (1)

2. Implementation of the standard is an NRC responsibility under the Nuclear Waste Policy Act. Provisions, such as those specifying the detailed parameters and conditions to be used in determining whether the standards are met and those specifying guidelines concerning the use of opinion in the licensing process, should be deleted. (219)

3. EPA should bear in mind that in setting its radiation standards, that the NRC will need some flexibility in implementing them as the Commission considers the license application that will be submitted by the DOE. (257)

4. TVA is concerned that the proposed rulemaking could result in having two federal agencies involved in determining compliance with radiation protection regulations and standards which could cause confusion for licensees and be potentially counterproductive to the interests of the general public. (299)

5. EPA should delete provisions that duplicate and conflict with the statutory authority of the Nuclear Regulatory Commission. (449)

6. It is not within the EPA's authority to specify whether or not the proposed repository meets applicable standards. This authority has been solely granted to the U.S. Nuclear Regulatory Commission. Examples of where the EPA standard attempts to impose methods for determining compliance include:

(1) the use of the term "reasonable expectation" versus the U.S. NRC term "reasonable assurance;"

(2) the requirement to apply the dose limit to the "reasonably maximally exposed individual" (RMEI), versus "average member of the critical group;" and

(3) specifying details of how the repository must meet the standard in the area of human intrusion. (403)

7. Comments such as EPA expects the engineered barrier system to be "backfill in the spaces between the waste packages and adjacent rock" is better left for the NRC and others to contemplate. (346)

8. We do not support the establishment of qualitative requirements in this proposed rule. We consider such requirements to be duplicative of EPA's intent to promulgate radiation standards that are fully protective of public health and safety. An appropriate level of confidence in the Department of Energy's (DOE's) compliance can be achieved through NRC's implementation of a site radiation standard. (769)

Response to Issue A:

EPA believes that the provisions of the proposal are clearly within its authority and are central to the concept of a public health and safety protection standard. It is reasonable and appropriate for a public health and safety protection standard not only to set the level to which the public must be protected but also to define who the standard should be assessed against and at what location. Moreover, it would be unreasonable for EPA to establish a purported public health and safety standard that did not include such vital parameters as who the standard should be assessed against and where it should apply. Such parameters are common features of radiological protection standards. For example, IAEA Safety Series No. 99 provides that for releases from a repository due to gradual processes the dose upper bound should be less than an annual average dose value of 1 mSv/yr for prolonged exposures for individuals in a critical group. Similarly, disposal standards issued by countries such as Sweden, France, and the United Kingdom specify a dose limit and a general statement of to whom the limit applies (note that other countries are generally much less prescriptive in these regulations than is the United States). These disposal standards are analogous to EPA's generic 40 CFR part 191 in the sense that they could apply to a number of possible locations, so they are written in broader terms. It is not inappropriate for a site-specific standard to include site-specific details. By defining such parameters as who the standard should be assessed against, at what location compliance is to be determined, and what is the minimum level of expectation applicable to EPA's standard, EPA has not usurped any responsibilities properly belonging to NRC. NRC will be the sole agency to determine compliance with the EPA standard and its own licensing criteria. The EPA standard leaves NRC with sufficient flexibility to adapt to changing conditions at the Yucca Mountain repository (e.g., gathering of site characterization data, improved monitoring capabilities, improved performance assessment models, or development of new materials for constructing engineered barriers), or to apply more stringent criteria in licensing the repository. The EPA proposal requires DOE to demonstrate a "reasonable expectation" that the repository will meet the relevant standard(s). As described in the preamble, and as set forth in great detail in responses to specific comments on the reasonable expectation approach (Section 2 of this document), EPA believes that "reasonable expectation" is a more realistic measure to apply over very long time periods than "reasonable assurance", which NRC prefers; however, because EPA does not require that NRC use reasonable expectation in its licensing determination, but, rather, recommends that reasonable expectation be the minimum level of proof used, EPA does not intrude inappropriately into the NRC's implementation responsibilities for decision-making. There is nothing to prevent NRC from applying the "reasonable assurance" concept in its licensing process, as doing so should satisfy "reasonable expectation" as well. In the case of human intrusion, EPA adopted the recommendation on framing the scenario from the NAS Report. In instances where EPA did not directly adopt an NAS recommendation, the proposal discusses the reasons for the deviation. There were no compelling technical or policy reasons to justify excluding or significantly altering the human intrusion scenario.

On the subject of backfill, DOE's most recent statements indicate that it is reconsidering the need or desirability of backfilling the emplacement drifts. Given these statements, and other comments on the subject, EPA is modifying the definition of "disposal" in subpart B of the rule to eliminate

the reference to backfill (see Issue RR). Regarding the description of EPA's "expectation" for the engineered barrier system in the preamble to the proposal, this was simply a generic statement describing the most recent thinking on repository systems in general and DOE's plans for the Yucca Mountain repository in particular, and echoed statements in the NAS Report (p. 27).

Issue B: EPA should be commended for its independence and strength of standard.

1. I want to compliment you folks for making your standard as stringent as it was. (62)
2. I would like the record to show that we truly appreciate the independence that the EPA has shown. As rules have changed on this project so many times, EPA is the one agency out of three when you count DOE, the Nuclear Regulatory Commission and the EPA, that did not choose to change its rules, and in fact, tried not to make it a different rule for Yucca Mountain but was ordered to do so. We appreciate the fact that you've stayed very independent.(104)
3. I must say I am pleasantly surprised that this standard has been put out in its present form, and it includes a ground-water standard, and that the EPA's managed to stick to its guns under the extreme political pressure that I know it's been under these past several years. (134)
4. [I]t is of concern to us that EPA's authority to set radiation exposure limits for ground water and other exposure pathways could be undermined by legislative dictate of a health standard. (491)

Issue C: EPA's standard is based on a completely inappropriate concept.

1. Emission limits in the form of radiation dose limits to individuals and to populations are appropriate for manufacturing facilities because emissions of radionuclides are expected and are to be regulated. The Yucca Mountain Repository is not such a facility and it is a gross error to treat it as such. (413)
2. As there will be no emissions from the repository under expected conditions for the next 10,000 years, this fact should be reflected in proposed standards for normal operations of the YMR. EPA should not propose standards based on hypothetical, very low probability accident conditions - such a course has no precedent and is not a credible regulatory procedure. In summary, EPA is proposing standards appropriate only for accident conditions, which it should not do, but has failed to propose standards for routine operational conditions, which it is required to do. (417)

Issue D: EPA's standard is too weak.

1. The EPA has proposed stronger standards than the NRC, but even these standards are too weak. The EPA should strengthen its standards! (453)

2. EPA radiation experts were not sufficiently knowledgeable about the traditional and customary Tribal uses to properly incorporate them into the formula upon which the draft standards are based. The result is that the standards may not be based upon accurate assumptions. (791)

Issue E: EPA's standard is too stringent.

1. We are concerned that the radiation standards in the proposed rule may make siting a permanent repository at Yucca Mountain (or elsewhere) more difficult, if not impossible. Until a permanent repository or centralized interim storage facility is sited, utilities will be forced to store the waste at plant sites which were never intended for storing waste indefinitely.(492)

Issue F: EPA's standard will hinder implementation without increasing protection.

1. EPA's proposed radiation standard would cause unnecessary expense, delay, and inefficiencies in the construction, licensing, and operation and maintenance of the repository at Yucca Mountain without any comparable increase in the protection of public health and safety and/or the environment.(273)

Issue G: EPA is compromising its mission with lax standards to make Yucca Mountain pass.

1. We feel that the standard should be legitimate and if that were the case, that Yucca Mountain would be eliminated from consideration for the national repository. (9)

2. The proposed rule places the focus for the release standard on the estimated capability of the proposed repository, rather than on an acceptable amount of risk for humans and the environment. Instead of starting from a baseline of what would be safe for the environment and the public, the Proposed Rule's standard is based on what the repository can accomplish. (176)

3. EPA's job is to protect the environment and public health, not to lower standards so that an unsuitable site like Yucca Mountain might still qualify. (350)

4. To lower standards due to political and economic pressures so that a unsuitable site would still qualify would set a terrible precedent within EPA, across the nation, and even internationally. (427)

5. It now appears that the constraints of the Yucca Mountain site are the determining factor in EPA's standards, which are largely being negotiated through closed-door interagency meetings before being issued publicly. (436)

Response to Issues B through G:

The EnPA mandates that EPA promulgate public health and safety standards that apply specifically to the Yucca Mountain site. Developing such standards required EPA to assess existing population patterns, land and water usage, and the geologic and hydrogeologic characteristics of the Yucca Mountain region. It was also necessary to make some reasonable assumptions about how those factors might change in the near future, and how any releases of radioactivity from the Yucca Mountain repository might reach the exposed population. EPA believes that its assumptions in these areas are prudent and defensible. Regarding the traditional and customary Tribal uses of the area, EPA considers that its assumptions used to describe the RMEI are appropriate, as the traditional and customary uses do not lead to the continuing, year-round exposures assumed for the RMEI (although some of these uses may take place at locations closer to the repository).

EPA's standard represents the level of performance the Yucca Mountain repository would have to meet for the specified compliance period. EPA's promulgation of the standard does not mean that a final decision has been made as to the suitability of the site, nor is it a determination as to whether the repository could meet the standard under any circumstances. The final decision as to suitability has yet to be made through the NRC licensing process.

EPA disagrees with the comment that its analyses are inappropriate for the expected conditions at Yucca Mountain. While it is true that DOE's design is intended to fulfill the purpose of the repository by containing and isolating the waste, the long time periods involved in projecting facility performance introduce significant uncertainties that cannot be ignored. EPA cannot justify categorizing continuing natural processes that might reasonably be expected to affect repository performance as "accident conditions" (unlike less probable, more catastrophic events, the effects of which would typically be evaluated during the licensing process). However, for the purposes of the management standards in subpart A, Yucca Mountain is indeed an operating system, just as are other present-day facilities handling radioactive materials. Relative to the disposal standards in subpart B, the Yucca Mountain disposal system is a passive system and has not been confused with an operating system. For exactly this reason, EPA recommends that "reasonable expectation" be the minimum level of proof used, which allows the NRC to take into account the inherently large uncertainties that will accompany the performance assessments for Yucca Mountain. (The commenter should note that the subpart A standards are not written using "reasonable expectation", but as a standard for a typical currently active operating facility.) EPA's standard takes into account the known natural characteristics of the Yucca Mountain region that can be predicted to endure, possibly with some boundable variation. In addition, the dose standard represents a level that EPA believes is protective for lifetime exposures to the RMEI, and is consistent with its other actions related to radioactive waste management, including those covering more "routine" operations (such as air emissions under radionuclide NESHAPs). See the discussion of comments on the level of protection in Section 4 of this document.

The coordination process conducted by the OMB in accordance with Executive Order 12866 permits the President to monitor and ensure the consistency of agency actions throughout the

Executive Branch. This process has been recognized as necessary and vital to the administration of the Federal government, and has been upheld by numerous court decisions [see, e.g., *Sierra Club v. Costle*, 657 F.2d 298, 405-06 (D.C. Cir. 1981); *State of New Mexico v. EPA*, 114 F.3d 290, 295 (D.C. Cir. 1997)]. With respect to the Yucca Mountain public health and safety standard, records summarizing all meetings throughout the OMB review process, and any substantive changes to either the draft proposed or draft final rules, have been placed in the rulemaking docket, as required by Executive Order 12866.

Issue H: EPA is the appropriate Agency to set the radiation protection standards.

1. We feel that EPA is much better able to protect the public's health and the environment than the NRC. (3)
2. I want to offer a strong support to EPA in all of its standards settings endeavors. We really feel that this is the only organization that takes quite seriously its responsibility for protection not only of public health but also of the environment. (28)
3. Although there have been some debate of utilizing the NRC to set protection standards, we maintain that this will compromise the integrity of the process. This is EPA's responsibility, and they should continue to serve this function. (68)
4. I am very happy to have this group, protective of the public and environmental sense, sort of act as a salutary force on what some gung ho scientists may be projecting, including some of the professors who have advanced in academia to a point where they're out of touch, actually, with their students. (95)
5. It's my opinion that the EPA is the natural agency to establish exposure standards for the public, and that agency, through its vast experience and real time data, is the best organization to establish this important standard for this program. (96)
6. The EPA has the regulatory responsibility we feel to develop, implement and monitor environmental protection standards. Utilizing the NRC to set protection standards we feel would compromise the integrity of this process. This is the EPA's responsibility, and they should continue to serve this function. (116)
7. We do however support EPA's authority to set standards for Yucca Mountain and the requirement of a ground-water specific standard for use in designing and licensing the Yucca Mountain repository. (131)
8. It seems to me the impression is the Nuclear Regulatory Commission is looking for cost saving ways from the Department of Energy when we're going to have this massive material that's going to be radioactive for 100,000 years, and it's not a time to be in my opinion, or at least speaking on behalf of my elected officials, to be cutting corners on the standard. (140)

9. I support EPA as the standard setter for the proposed Yucca Mountain nuclear waste dump, as opposed to replacing EPA with the Nuclear Regulatory Commission (NRC). (185)

10. The EPA should set the standards for Yucca Mountain because it would better protect the health and safety of the public and the environment. (192)

11. The Mayor and the City Council of Las Vegas understand EPA's responsibility in establishing these standards and disagree strongly with the Congressional attempt to have the Nuclear Regulatory Commission establish a lesser standard which is inappropriate and will not provide the level of public health and safety that would be established under the EPA rule. (204)

12. In all the options offered, the proposed standards are very conservatively protective of public health and safety. (458)

13. EPA has probably made a reasonable compromise, given all the existing pressures. While the end result may still be standards that are excessively stringent, they are an improvement over some of the NAS proposals. (475)

14. This comment is to support the U.S. Environmental Protection Agency (EPA) as the standard setter for Yucca Mountain. (404)

15. We want the EPA to set standards for Yucca Mountain or for any nuclear waste repository. (408)

16. We much prefer EPA as the standard setter for Yucca Mountain than the U.S. Nuclear Regulatory Commission (NRC). (426)

17. We support EPA's proposed rule because the radiation standards are consistent with those already adopted and approved by EPA for other repositories, including the Waste Isolation Pilot Project in New Mexico. (528)

18. We agree with consistency in rulemaking and urge EPA to move forward with amending 40 CFR 190 and 191 to reference CEDE methodology. (761)

19. We support EPA's choice of a risk-based individual dose standard expressed as an annual CEDE limit. . . However, we do not agree with all aspects of EPA's specific implementation of the standard. (762)

20. We commend the EPA for stepping forward and proposing environmental radiation protection standards for Yucca Mountain and for directly soliciting input of affected Indian Tribes. (789)

Issue I: NRC is the appropriate agency to set the standard.

1. EPA has seen the comments on the proposed rule provided by the NRC and support the positions taken by the NRC. We have trust that the NRC has the expertise, experience, and charter to properly license a repository facility that will protect public health and safety and the environment. (253)
2. As the federal agency principally and historically responsible for radiation protection, we believe the NRC is qualified to determine adequate radiation standards for the repository. (493)

Response to Issues H through I:

Pursuant to Section 801 of the EnPA, EPA must promulgate public health and safety standards for protection of the public from releases from radioactive materials stored or disposed of in the repository at Yucca Mountain. The NRC must utilize the EPA standards in its licensing action for the Yucca Mountain repository.

Issue J: Sufficient notification of the public hearings was not given.

1. I'm saddened or a little disappointed, perhaps, that the notice of the extension of this session into this evening was, perhaps, not as widely disseminated as was possible. (76)
2. First, I would like to say that there's a real problem with people getting to the hearings. You may have noticed that. We have hearings going all over the country and all over the State of Nevada. . . There are county officials and representatives of other citizen groups who just had to make the choice and could not make it here, and they are being encouraged to submit written comments. (103)

Response to Issue J:

Because of the importance of public involvement in this issue, EPA makes every effort to inform the public of opportunities to obtain information or provide comment, and to provide adequate notice of upcoming events. EPA compiled an extensive mailing list of interested parties and provided up-to-date information through the EPA Web page and a telephone hotline. EPA requested that members of the public who wished to speak at the hearings register in advance, and very few people did so. There may be occasions in which a decision is made on short notice to extend a hearing, and it may not be possible to ensure that every interested person is informed. It's unfortunate that the schedule is inconvenient for some people, but EPA is required to announce hearing dates well in advance.

Issue K: EPA is not protecting Nevadans at the same level as WIPP/Other Radiation Regulations. (430)

1. How can, or why would, Nevadans be less deserving than the New Mexicans for protection, and so why would there be a difference between the point of compliance between Yucca Mountain and WIPP? (12)
2. In many respects the alternative presented in the proposed rule would be less protective of human health and the environment than those applied to WIPP, and appear to be responsive to the uncertainties associated with the capabilities of the Yucca Mountain site to safely isolate high-level radioactive waste. (456)
3. I am even more perplexed as to why the EPA would want to lower some of its radiation standards in the case of Yucca Mountain, considering the controversy and risk now associated with natural geological disposal. Due to the potentially enormous gravity of a high level radioactive waste leak, it would seem to be the EPA's obligation to hold the Yucca Mountain repository to at least, if not more, stringent standards than it has used in the past to regulate radiation. (210)
4. Recognizing that this performance goal is probably unattainable at Yucca Mountain, it becomes even more important that the safety standards for this site be at a minimum as stringent as and consistent with, other applicable radiation protection standards. That would mean that the standard for Yucca Mountain must be the same as that for the WIPP repository including a 15 mrem annual individual dose exposure from all sources. The standard should include a ground-water protection standard equivalent to the four mrem annual individual dose set by the Safe Drinking Water Act. The boundary for the controlled area applied under the WIPP standard should be no farther than five kilometers which would provide adequate protection to residents living in the Amargosa Valley, within 20 miles of Yucca Mountain. (424)
5. The standards for protection of the public and the environment otherwise required by DOE, NRC, and U.S. EPA are not being applied to Yucca Mountain. (760)

Response to Issue K:

The EnPA explicitly requires that EPA promulgate public health and safety standards that apply specifically to the Yucca Mountain repository. In doing so, EPA evaluated information describing local population patterns, land and water usage, and the geologic and hydrogeologic characteristics in the Yucca Mountain region. EPA's standard incorporates reasonable assumptions regarding the future development and behavior of Yucca Mountain. Based on these reasonable assumptions, EPA concluded that there are unlikely to be significant permanent populations or extensive water demand much closer to the repository than at present because of the difficult terrain and the fact that, as one moves closer to the repository, the ground water becomes much less accessible (see Chapters 7 and 8 and Appendix VI of the BID). EPA's proposed dose standard represents a level that it believes is protective for lifetime exposures to

members of the public and is consistent with its other actions related to radioactive waste management.

The WIPP, however, must comply with EPA's generally applicable standards in 40 CFR part 191. These standards are not site-specific and potentially apply to sites with a range of characteristics throughout the United States (see 40 C.F.R. §§ 191.01, 191.11, 191.21). The provisions of these standards (e.g., definition of controlled area, assurance requirements, release limits) are intended to protect future populations that might be able to locate fairly close to the repository, while ensuring, to the extent possible, that the site will perform adequately. These specific provisions may not be necessary at Yucca Mountain (e.g., the release limits in 40 CFR part 191 were included to protect populations, while the conditions at Yucca Mountain are such that the individual protection and ground-water standards are sufficient). Note that the WIPP site would be much more accessible for future settlements than Yucca Mountain (and, in fact, there are currently permanent residents at the boundary of the WIPP controlled area). The individual dose standard proposed for Yucca Mountain is identical to that applied to WIPP (15 mrem annual committed effective dose equivalent from "all potential pathways from the disposal system"), as are the ground-water standards.

Issue L: EPA's standard should consider the cumulative/additive impact of NTS and other existing sources of contamination. (564)

1. Yucca Mountain does not exist in a vacuum out there. The Nevada Test Site is right there. The low-level nuclear dump is right there. . . All of these multiple exposures should be considered in a connected way, and not in isolation from each other. (14)
2. [T]here is a concern about overall population dose that does not seem to have been given due consideration. The produce of the Amargosa Valley already ends up in the Los Angeles markets, and again, given the potential for climate change, for alterations of land use, that could become a more significant factor, particularly when we add in the anticipated additional doses from deregulated materials that may be recycled into consumer products over time, and many other sources of ionizing radiation, and alternatively, other contaminants. (36)
3. We have a certain amount of background exposure. It's higher than many parts of the country. And my initial question is, "Why make it worse? Why allow it to be worse?". . . It may not be statistically significant, but it's significant to us to create a certain amount of additional concern. (63)
4. Another major concern is that the Yucca Mountain program is being treated as an isolated project without considering that it should be evaluated along with other issues associated with the Nevada Test Site and contamination. (115)

5. [T]he county feels very strongly that all federal decision makers must take into account the cumulative impacts which the county and its residents have already experienced from fifty some years of weapons testing and nuclear waste disposal activities on the Nevada Test Site (NTS). . . the policy of Nye County is that no additional radiological burden should be imposed upon the public, now or in the future. (300)

6. [T]here can be no acceptable justification for the exclusion of pollutants found at the adjoining Nevada Test Site and Nellis Air Force Range from the calculations of doses relative to Yucca Mountain. (357)

7. Cumulative effects from multiple sources received over an individual lifetime of exposures must be taken into account in addition to annual doses. (359)

8. The individual protection standard can not solely consider contamination from Yucca Mountain, but, also must consider the cumulative affects of underground weapons testing. The individual protection standard should be applied to and must consider all potential contamination streams. (499)

Response to Issue L:

EPA recognizes that there are several potential sources of radionuclide contamination in the Yucca Mountain area besides the proposed repository and the concern this may cause among residents of Southern Nevada. The NTS has been subjected to both above and belowground testing of nuclear weapons, and DOE has also disposed of significant amounts of low-level and TRU waste at the site. The now-closed Beatty commercial low-level waste disposal site is located west of Yucca Mountain. The most likely transport path of contaminants from these sites would be through ground water. The available information suggests that the same ground water could provide transport for radionuclides from Yucca Mountain and affect the same population(s) (see Chapter 7 of the BID). There may also be significant potential for exposure to radioactivity from natural sources in the area.

DOE provides an estimate of the total effect of contamination at these locations in Section 8.3.2 of its DEIS. The greatest inventory of radionuclides is present in soil at NTS as a result of nuclear weapons testing. Using several conservative assumptions (total inventory available for transport, all transport along the same flow path serving Yucca Mountain, limited dilution), DOE estimates that the maximum potential dose over 10,000 years would be approximately 0.2 mrem/year. Since other activities at NTS and Beatty represent a much smaller radionuclide inventory, exposures from those sources would be a fraction of that from weapons-related radionuclides. DOE believes that a more rigorous analysis would result in even lower estimates.

EPA's mandate is to set standards that apply to activities at the Yucca Mountain repository, not to quantify potential exposures from these other already-existing sources. Moreover, the peak doses from these sources would not necessarily correlate with those from the repository. For example, exposures from low-level waste operations would be expected to peak after a few

hundred years, while the expected peak doses from Yucca Mountain are expected significantly later.

In addition, EPA's standard is consistent with existing international guidelines on radiation exposure, which recommend individual limits on non-occupational exposures from non-natural sources (excluding accidents and medical procedures). These guidelines recommend allocating a fraction of the overall limit to any particular activity precisely in order to account for multiple potential sources. On the question of population doses, EPA has used reasonable assumptions regarding the future population of the Yucca Mountain region and the resultant demand on ground water in characterizing the RMEI. Any member of a more distant population exposed solely through ingestion of produce would be expected to receive doses significantly smaller than the RMEI. In addition, as stated on page 46991 of the proposal, the limited potential for dilution of ground water at Yucca Mountain is one reason it is not necessary to include the type of population-protection requirement included in 40 CFR part 191. Part 191 used a model that included an aquifer emptying into a river and eventually reaching an ocean. Such a mechanism for exposing large populations to small amounts of radiation does not exist at Yucca Mountain.

Issue M: Transportation of SNF/HLW is not safe/must be better regulated than current.

1. God forbid DOT should do the transport after their horrible record with the chemical industry, two hundred and fifty thousand plant accidents and two hundred and sixty thousand on the roads from 1987 to 1996, and they are not indemnified, not even for five hundred and fifty million. So this is terrifying. (42)
2. Our nonexistent highways and railroad trains would be a hundred feet long by ten by twelve. It is absurd. The trucks -- eighty-two thousand pounds is allowed in Nevada. And these trucks are a hundred and twenty tons. The canister, from what I have seen, is a hundred and twenty-five thousand pounds. So they way exceed anything that you could possibly have. (48)
3. Now, how can you possibly have trucks going on any highways, fifteen thousand to thirty miles an hour or trains doing the same thing without an accident? And this is not talked about either. I think it's of major importance. (49)
4. When your containers are transported, your truck drivers have a little badge that says they're only allowed to be exposed to the load for a certain amount of time. That tells me you're transporting leaky containers. (64)
5. One glaring case in point, there is a map on -- I think it's page S-28. Please don't hold me to the particular page. There's a nice little transport route from Jean to up this direction. And it looks like a great route if you don't know the area. If you do know the area, you know that Pahrump is significantly missing from that map, and the route goes right through Pahrump. (66)
6. The risk from the transport of waste for the immediate future offers a greater potential risk for Nevada citizens. (72)

7. EPA and the NRC as regulatory agencies need to ensure that the public is protected from the potential large number of shipments of nuclear waste that will be transported throughout the nation should Yucca Mountain open as a repository. (123)
8. So as a Kansas Citizen, as a citizen, in general, of the country, I would be very concerned about that going on and I would have to support Ms. Drey in her suggestion that none of this stuff should be moved, especially through our cities and through populated areas along our interstate highways. (156)
9. Mineral County would like to have a separate standard for transporting the radioactive nuclear waste. (199)
10. I just sent to Senator Reid a proposition for emergency medicine for Nye County. . . We have no help here any which way, really, no facilities. (43)
11. There is no way anyone would feel comfortable living under the constant threat of getting cancer from extra radiation given off by the train or accidents. (505)
12. [T]he Shoshone-Paiute Tribes hereby demand that nuclear waste destined for the proposed Yucca Mountain Repository, not be transported through the Duck Valley Indian Reservation on Nevada State Highway 225 and Idaho State Highway 51. (781)

Response to Issue M:

The EnPA mandates that EPA promulgate public health and safety standards for protection of the public from releases of radioactive materials stored or disposed of in Yucca Mountain. The EnPA does not separately provide EPA with authority to regulate transportation of SNF and HLW outside the Yucca Mountain site. Transportation of radioactive materials is generally regulated by NRC, DOE, and/or the DOT. DOE has prepared a DEIS that includes information related to transportation of SNF and HLW to Yucca Mountain.

Issue N: Yucca Mountain is not a safe site/cannot be made safe/cannot be corrected.

1. If you look at the Yucca Mountain project as it's described today in the Environmental Impact Statement and other documents, it becomes clear that it is designed to leak. The only question is when will the leaks begin? Another question is how fast will the leaks occur? Another question is how fast or how soon people in this valley begin to become exposed? That's not the people's conception of safety. (51)
2. If Yucca Mountain isn't safe, this is one problem we can't correct. If our water is polluted, we can't grow our crops and we can't raise our children and we don't have a future. And all of us here have worked hard for that future, and we want to make sure that everything is done properly and it's done safely.

And if there are minor problems which, in the future, might cause problems to our generations down the line, however minor they may be, I don't want to see the Yucca Mountain come in. (60)

3. [O]nce the project gets started, if there were found to be leaks that impacted this area, then, aside from having state limits, what would happen? (75)

4. I am opposed to shipping the irradiated fuel rods from over 100 nuclear reactors on the highways and railways of the United States out to one location, especially to a seismically-active site where in the past 20 years there have been over 600 earthquakes of greater magnitude 2.5 within a 50 mile radius. (147)

5. How can we keep 300 generations of our descendants away from these lethal wastes? (154)

6. [I]t is unlikely that the Yucca Mountain site will provide a safe repository for geologic nuclear waste isolation as required by the guidelines of the Nuclear Waste Policy Act. (423)

7. The selection of Yucca Mountain as a dumpsite for high-level radioactive waste is an egregious error that will threaten the coming generations for with impure air and water poisoned by radioactive waste. (450)

Response to Issue N:

The purpose of the EPA standard is to ensure that any potential releases from the Yucca Mountain repository do not result in unacceptably high exposures to affected populations. EPA's standard makes no judgment regarding the suitability of the Yucca Mountain site. The final decision on the suitability of the site has yet to be made.

Regarding the presumed safety of the site, it is standard practice in radioactive waste disposal to conduct a *performance assessment*. A performance assessment is an analysis intended to indicate how the disposal facility will perform over hundreds or thousands of years, the time that is necessary to isolate long-lived radionuclides. Parameters can be varied to see how the results change or how the facility would perform over a range of conditions. Facility designers use this information to predict whether the facility can meet the applicable environmental standards or whether some part of the facility needs to be improved. Given the long time frames involved, there can be areas of significant uncertainty, so performance assessments generally select parameters that are somewhat conservative (but not the absolute "worst case"). This includes assuming some release of radioactivity, so that the most probable routes of transport through the surrounding environment can be examined.

Issue O: Consider other alternatives to waste disposal/current proposed technologies.

1. The equipment is available to clean up these things. This whole thing can be stopped, and it can be reprocessed and transmuted. (44)

2. The other thing that the EPA, I think, needs to get into, is [that] this so-called waste is a really valuable resource if properly handled by standard technology. It'll generate seventy-two billion dollars worth of power at a very nominal cost. (91)
3. I believe this high level, lethally high level radioactive waste should be kept on site at the nuclear power plant at which it was generated until a safe technology has been developed to neutralize it, to make it not radioactive. (148)
4. I hope the EPA will have the opportunity to question the effectiveness of borosilicate glass; that is, the Nuclear Regulatory Commission's reliance on vitrification as a technology to solidify high level radioactive waste sludges and liquids. (152)
5. Consider sending nuclear waste into space! (454)
6. How can EPA get your organization to show the trillionaires who own the nuclear power plants how to make money? By helping this powerful group can EPA convince them that Y.M. 1 & 2 are not acceptable analogs? How can you assure this group that transmutation, recycling etc. will ensure their continued prosperity? (485)
7. All states should share the burden equally for storing nuclear waste because it will keep people tuned into the serious problems that the nuclear industries create. Only when people's personal lives are close to this deadly waste will the less toxic energy options be developed even though we are told they aren't economical. (506)
8. Keep this waste above ground in the state where each was created. Then each state should guard, monitor, and re-cask the waste forever. (540)
9. [W]e feel that an assessment of the risks of opening a Yucca Mountain repository always should be considered in the context of risks associated with other choices for disposal or storage of the waste. (553)

Response to Issue O:

Pursuant to the EnPA, EPA is authorized to promulgate public health and safety standards for protection of the public from releases of radioactive materials stored or disposed of in Yucca Mountain. The EnPA does not authorize EPA to consider how the risks from the Yucca Mountain repository compare to other management options (or to pass judgment on the specific technologies employed at the repository). There may in fact be alternatives that are now or will in the future be generally preferred over disposal in a geologic repository, either because of technological advances or as a result of future public policy choices.

Issue P: EPA must implement the recommendations of the NAS into the standard.

1. Wherever NAS has made a definitive determination regarding the technical basis for the standard, EPA is bound to apply that decision in its rulemaking.

It is, however, apparent that there were a number of areas (such as the time of compliance) where NAS conceded that there might be policy reasons for not following its technical recommendations and, hence, was not definitive. It is therefore appropriate that, in such instances, EPA can deviate from the NAS recommendations provided there is a public health and safety policy reason for doing so. (239)

2. EPA's argument is strictly one of policy and exaggerates the impact of the NAS Report on its rulemaking authority and its duty to protect the public health and safety. Applying the NAS findings and recommendations, as required by statute, would not diminish or infringe upon the Agency's authority to promulgate rules governing radiation protection at Yucca Mountain, nor would it preclude meaningful public comment thereon. Contrary to the suggestion made by the EPA in the SOC for the proposed rule, the NAS has not attempted to assume the EPA's standard-setting responsibility, but rather has provided, as directed by Congress, the scientific basis that should bound that effort. Therefore, applying the dictates of the APA, the EPA's proposed rulemaking is arbitrary, capricious, an abuse of discretion, or otherwise not in accordance with law; exceeds the EPA's statutory jurisdiction, authority, or limitations; and is unsupported by reasoned decision making. (275)

3. IEER believes that the EPA must treat the TBYMS report as authoritative unless:

(1) there was an internal disagreement on the panel, in which case the EPA must exercise its own well-considered scientific judgement;

(2) there are clear scientific, environmental or health protection grounds to reject the TBYMS report's analysis or recommendations and adopt a different approach;

(3) or the TBYMS report did not take into account certain health or environmental factors, thereby leaving open the door for the EPA to use its own scientific judgement. (280)

4. EPA's proposed standard is not consistent with the National Academy of Sciences' (NAS) findings and recommendations in this report, and the proposed separate ground-water standard is specifically not recommended by the NAS. (494)

Issue Q: EPA is not bound to implement the recommendations of the NAS into the standard.

1. EPA remains the agency that was directed by the Congress to promulgate these dose limits, and the limits must first and foremost be protective of public health and the environment,

consonant with but not overridden by findings and recommendations in the Congressionally mandated report of the National Academy of Sciences. (352)

2. [We] agree with the EPA's position that the NAS recommendations cannot be binding on the Agency's independent rulemaking authority. (455)

3. I think it is good that EPA is not letting NAS dictate outcomes, but is using their views as advisory. (542)

4. We endorse EPA's departure from NAS' findings and recommendations on the compliance period. (766)

Response to Issues P through Q:

As set forth in the preamble to the proposed rule, it is clear that the intent of the EnPA is that the NAS assume a special role in advising EPA on technical matters in this rulemaking (64 *FR* 46981-46983). Pursuant to that statutory mandate, EPA has given the NAS Report special weight in developing its standard; however, there is no basis for the conclusion that the EnPA intended to require that EPA adopt the NAS' findings or recommendations directly into the standard without question or consideration. In addition, another factor to consider is that more than four years elapsed between publication of the NAS Report and the proposed rule. A tremendous amount of data has been collected in that time, resulting in greater understanding of the site's characteristics and the capabilities of the disposal technology and computer models. Whether the NAS' broad conclusions would change is not clear; however, it does seem clear that there is additional information to incorporate into specific aspects of the standard.

Issue R: EPA should not issue guidelines on expert elicitation.

1. We generally agree with EPA's views on expert elicitation expressed on Page 46997. However, setting guidelines in this area is an implementation issue that should be left up to the NRC. (247)

2. Expert elicitation should not be used to estimate parameters using Delphi surveys or similar techniques. This restriction should be specified in the EPA standard because Delphi type of techniques can create more problems than they solve and, moreover, exclude the public from vital areas of debate. (290)

3. Any guidelines for the use of expert opinion should be set by the NRC, the only agency responsible for the conduct of the licensing process itself. (312)

4. Use of expert elicitation by NRC or DOE will be subject to the public process used in the licensing proceeding. A separate EPA guideline would be inappropriate. (329)

5. It is not appropriate for the EPA to set guidelines for use of expert elicitation in the licensing process. (347)
6. The NRC's NUREG-15G3, "Branch Technical Position on the Use of Expert Elicitation in the High-Level Radioactive waste Program," provides an acceptable functional guide, if applied as intended. It would not be productive to reopen this issue for consideration when the basic principles and methods have already been explored and the existing guidance is seen as reasonable. (376)
7. It is unnecessary for EPA to set such guidelines in this standard, because of the fact that NRC has had such guidelines in place since 1996 (NUREG 1563) and the fact that DOE has used NRC's guidelines since that time to conduct several elicitations of expert opinion. (575)
8. It is unnecessary for the EPA to set guidelines for the use of expert opinion in its standards for Yucca Mountain. The NRC's licensing requirements and licensing process will govern the DOE's use of expert opinion in the development of its licensing case for a repository at Yucca Mountain. (606)
9. EPA should not include specific requirements for expert elicitation. (651)
10. We do not consider it appropriate for EPA to set guidelines for the use of expert opinion in this standard. We consider that the NRC will appropriately establish the use of expert opinion during the licensing process. (768)

Response to Issue R:

The comments EPA received were uniformly opposed to EPA's setting requirements to address expert opinion. There was general agreement among commenters that it would be more appropriate for NRC to use the licensing process to address any requirements relating to expert elicitation. Some commenters referred to NRC's existing NUREG-1563 ("Branch Technical Position on the Use of Expert Elicitation in the High-Level Radioactive Waste Program"), and to the fact that DOE has used it on several occasions. These comments reinforced our opinion that issuing requirements would be an implementation function better left to NRC.

Issue S: The Yucca Mountain site should not be used for SNF/HLW disposal.

1. [T]he Ely Shoshone Tribe hereby establishes and records its disfavor for the proposed Yucca Mountain Repository facilities for reasons as indicated in this resolution. The Tribe also believes that the overall negative environmental impacts must be minimized to the greatest extent possible. (315)
2. [T]he Elko Band Council recognized that our Tribal membership will be affected in all aspects of the Yucca Mountain Repository and strongly opposes the Yucca Mountain Repository for Spent Nuclear Fuel and High-Level Radioactive Waste at Yucca Mountain, Nye County, Nevada

and is against any and all nuclear waste that may be transported through the Elko Indian Colonies in Elko, Nevada. (754)

3. [T]he Elko Band Council hereby establishes and records its disfavor for the Yucca Mountain facilities for reasons indicated in this resolution. This Council believes that the overall negative environmental impacts must be minimized to the greatest extent possible. (756)

4. [T]he Shoshone-Paiute Tribes hereby establish and record its disfavor for the Yucca Mountain facilities. The Tribes also believe that the overall negative environmental impacts must be minimized to the greatest extent possible. (782)

5. The fact the Washoe Tribe is submitting comments should in no way be construed to mean that the Washoe Tribe supports the placement of a nuclear waste repository at Yucca Mountain. (787)

Response to Issue S:

The EnPA mandates that EPA promulgate public health and safety standards for protection of the public from releases of radioactive materials stored or disposed of in Yucca Mountain. EPA does not have authority to regulate transportation of SNF and HLW outside the Yucca Mountain site or evaluate the impacts of alternative management, nor will it make the final decision on the suitability of the Yucca Mountain site. The final decision has not yet been made, and will be made by other agencies.

Issue T: No release of radioactivity is acceptable - EPA's standard must reflect this.

1. The whole idea of a repository is to ISOLATE radionuclides from the environment for the required period of time. Simply DELAYING the off-site migration of radionuclides for an arbitrary period of time that is 90,000 to 1,000,000 YEARS too short smacks of the same dementia that is infecting Murkowski and the nuclear thugs at NRC. (406)

2. To preserve our own collective integrity during our time now on Earth and to be responsible to our children and posterity for untold thousands of generations, repository standards must require natural barriers to allow zero release of radioactivity. (407)

3. What we strongly urge is that you work toward total isolation of the nuclear waste from the environment for the totality of its hazardous radioactive life with NO release of radioactivity! (411)

4. Application – for purposes of repository design – of the EPA standard, or any standard that allows the repository to release *any* radioactive material from the facility, constitutes Federal and affected-agency acquiescence to the construction of a “leaky” repository. (487)

Response to Issue T:

EPA's dose standard represents a level that it believes is protective for members of the public, and is consistent with its other actions related to radioactive waste management. The standard is based on an appropriate level of public health protection in the Yucca Mountain region, not on the contents of the repository. EPA also has a responsibility to set a standard that can be implemented, and with which it can be determined if the facility complies. While an absolute certainty of zero release is an ideal goal, it is likely to be extraordinarily costly to meet, impossible to demonstrate with reasonable expectation, and may preclude society from addressing more threatening health conditions. Regarding the use of natural barriers, they do influence the suitability of a site. However, natural barriers are subject to the same long-term stresses as engineered barriers. Their effectiveness can be compromised by weathering, seismic activity, volcanic activity, or climatic changes.

Issue U: Geologic disposal of SNF and HLW is underground injection.

1. EPA's argument that geologic disposal of high-level radioactive wastes is not a form of underground injection is contrary to established case law. (443)

Issue V: Geologic disposal of SNF and HLW is not underground injection.

1. [E]mplacement of HLW and SNF in a geologic repository would not constitute "underground injection" and the UIC Class-IV ban does not apply to underground repositories. (639)

Response to Issues U through V:

EPA described at some length its reasoning in not classifying geologic disposal as underground injection (pp. 47004-47007 of the proposal). Without reproducing this extensive discussion, EPA's position is that disposal of SNF and HLW in the Yucca Mountain repository is not underground injection because: (1) the extensive series of engineered cavities at Yucca Mountain is not a "well;" (2) mechanical transport and ordered emplacement of waste packages within those cavities is not "injection;" and (3) containerized radioactive waste is not a "fluid" that "flows or moves." The commentor offers no compelling reason for EPA to change that interpretation. The case law referred to is *NRDC v. EPA*, 824 F.2d, in which the commentor states "the Court resolved this very issue [underground injection]." EPA disagrees that the issue was resolved (see p. 47004, col. 1 of the proposal).

Issue W: Spent nuclear fuel must be moved from its present locations as soon as possible.

1. We want the repository built in a safe, economic and expedient manner as required by the Nuclear Waste Policy Act, and whatever other laws and regulations will apply. We want the waste moved from its present locations as soon as possible. (17)

2. I distrust the Federal government to handle really important issues affecting my life. I distrust the motivations of the EPA in their management of this country's environmental issues. I distrust EVEN MORE motivated individuals and groups who could gain access to SNF and HLW from its current repositories around the country. These individuals and groups may use SNF and HLW to contaminate the world in which I and my family live. (158)

3. The NTS is already a "nuclear wasteland" which needs mitigation and security. The NTS is a better site for SNF and HLW than the populated and "wetter" regions of the east and south where these are currently "temporarily" stored. (159)

4. Our message is simple: the repository must be built in a safe, economic and expedient manner as required by the Nuclear Waste Policy Act and whatever other laws and regulations that apply. The waste must be moved from its present locations – which were never intended to store the material indefinitely – as soon as possible. (254)

5. Numerous stakeholders have proposed that allowing indefinite storage of spent nuclear fuel at operating and decommissioned facilities is an option. However, the HPS believes that such an option avoids, rather than offers a solution to the HLW disposal issue. In addition, it ignores the legal obligation of the federal government to take possession of, and provide for safely disposing of spent nuclear fuel, not only from nuclear power reactors, but also from our national defense program. (419)

6. Or should it [the base case against which Yucca health impacts would be assessed] be a case in which the waste is held in indefinite surface storage at many sites? Each of these waste-storage sites is much closer to a large population center and more vulnerable to human intrusion than any acceptable permanent geological repository would be. The reality is the latter, and perhaps the calculations and projections required for licensing a nuclear waste repository should reflect this reality. (474)

Response to Issue W:

The EnPA mandates that EPA promulgate public health and safety standards for protection of the public from releases of radioactive materials stored or disposed of in Yucca Mountain. EPA does not have the authority, nor is it EPA's role, to resolve the significant differences of opinion regarding the appropriate location(s) for disposing spent nuclear fuel and high level radioactive wastes.

Issue X: It is unrealistic to rely on untested canisters for millions of years.

1. We are not going to have one repository, but two that cost fifty billion dollars. The canister is ten, eleven to twenty to twenty-two. Canisters will be a hundred and twenty billion dollars. Because these things cost three hundred and fifty to five hundred thousand apiece. Can you afford it? (47)

2. And in Yucca Mountain where you have waste that has a nine hundred million year half-life and we're looking at several billion years before that thing is safe to dig into or walk around and so forth, I think that having [a canister] that will split up in two to six months is probably not what we want. (87)
3. And is there a disposal container design capable of what you expect? I don't think so. Nobody knows. None has been built or tested at all, much less long-term. (537)
4. Has a drip shield ever been tested?....And what holds the casks? Will it be on a pedestal of ceramic – heavy metal? (538)

Response to Issue X:

The EnPA mandates that EPA promulgate public health and safety standards for protection of the public from releases of radioactive materials stored or disposed of in Yucca Mountain. EPA is not authorized to design, construct, test, or approve the waste package. The package will be one component of an overall system that will have to meet EPA's standard, among other specifications. The DOE/VA has more information about the various materials and configurations under consideration for the waste package.

Issue Y: Current monitoring related to NTS is inadequate.

1. [M]onitoring is not being done properly, and you are not getting the right numbers. (46)
2. We have in Pahrump a monitor that's right next to the community center. I was talking to the guy that runs it, and he laughed and said, "It's a waste of time. Never found any radioactivity ever". . . all of our dirt around here has at least a half a picocurie of plutonium per gram in it. And while that may not be a problem, the instrument not being able to detect it is a problem. (89)

Response to Issue Y:

The type, location, and frequency of monitoring during the repository's operating period and after closure has yet to be determined.

Issue Z: How is EPA going to help the local community?

1. And all these things that they promised in the beginning has not resulted. . .we would like to know what kind of help you're going to give our communities to develop things. We have to lose a lot of things. . .We need roads. We need park systems. All these things, I know you guys can help develop these things. (61)

Response to Issue Z:

The concern over the impact the Yucca Mountain repository will have on such things as infrastructure and property values is understandable. It is also reasonable to expect that any promises made to local residents on behalf of the United States Government will be fulfilled. Unfortunately, these considerations are beyond the scope of EPA's standard-setting role. EPA is not in a position to give assurances to the communities in the Yucca Mountain region, and is not aware of assurances made by other government agencies.

Issue AA: The Yucca Mountain repository will contain hazardous waste in violation of RCRA

1. I'm particularly concerned about the chromium, molybdenum, nickel. And continue, in YMP and risk assessment environmental statement, they do not comply with EPA rule and regulation such as RCRA. You cannot show me. It's a violation of the law. (101)

Response to Issue AA:

EPA does not believe that there is any basis to conjecture that the repository at Yucca Mountain would operate in violation of the requirements applicable to RCRA hazardous wastes. Section 6001 of the Solid Waste Disposal Act requires that any Federal department or agency that is engaged in any activity that results or may result in the disposal or management of solid waste or hazardous waste is subject to, and must comply with, all Federal, State, Interstate, and Local requirements respecting the control and abatement of solid waste, or hazardous waste disposal and management [42 U.S.C. § 6961(a)]. EPA has no reason to believe that DOE will not comply with this express statutory obligation should solid or hazardous wastes be disposed of or managed in the Yucca Mountain repository.

Issue BB: There has been enough study - Yucca should be opened now.

1. After 20 years of investigation and deliberation the concept such as Yucca Mountain should be implemented without further delay. (157)

Response to Issue BB:

The final decision regarding the suitability of the Yucca Mountain site has not yet been made. The process leading up to that decision was established by Congress through the NWPA, the NWPA, and the EnPA. Even if Yucca Mountain had received final approval, there is still significant construction work to be done on the repository and a license must be issued.

Issue CC: EPA has insufficient information on the waste to issue a standard.

1. You say "non-solid waste forms would not be allowed to be stored or disposed of in Yucca." That makes no sense, for that is certainly the result long-term. (533)

2. No low-level waste should be allowed. (534)
3. How on earth can you base any analysis for Yucca Mountain Radiation Standards when you know very little about what the radiation source will really be like when it arrives at the repository? (536)

Response to Issue CC:

The prohibition on liquids is one measure to reduce the stress on the waste package. If liquid waste were accepted, the liquid could come into direct contact and begin to corrode the package from the inside. Whether or not the vitrified waste can maintain its form for long periods and at high temperatures, it will delay any contact with the waste package. LLW would generally be considered to present a much lower hazard than SNF. If "Greater-than-Class C" LLW is to be accepted by the repository, appropriate packaging would have to be used (Greater-than-Class C waste is generally considered not appropriate for typical shallow land burial sites, and is generally recommended for disposal in a geologic repository such as the proposed Yucca Mountain facility). The commentor suggests that it is not wise to put LLW in the repository, as the overall volume of waste that can be disposed is limited; that decision does not rest with EPA. The proposed dose standard represents a level that EPA believes is protective for members of the public, and is consistent with its other actions related to radioactive waste management. The standard is based on an appropriate level of public health protection in the Yucca Mountain region, not on the contents of the repository. The repository system will have to be designed, constructed, and operated so that it meets the EPA standard and the requirements of the facility license.

Issue DD: The Yucca Mountain repository will violate Environmental Justice requirements.

1. Environmental justice will not prevail and that's obvious. (548)

Response to Issue DD:

The EnPA mandates that EPA promulgate public health and safety standards for protection of the public from releases of radioactive materials stored or disposed of in Yucca Mountain. The EnPA does not authorize EPA to evaluate alternative sites, or to assess other impacts to local populations. DOE has prepared a DEIS under NEPA, which requires assessment of the cultural and archeological significance of affected sites, among other aspects. The final decision on the suitability of the Yucca Mountain site has not yet been made.

Issue EE: EPA should force DOE to clean up NTS.

1. And if the DOE is not responsible for handling that and the EPA doesn't step into it, how much trust do you think you're getting from the public that you can handle this Yucca Mountain problem, I think, is my point. (90)

Response to Issue EE:

The EnPA mandates that EPA promulgate public health and safety standards for protection of the public from releases of radioactive materials stored or disposed of in Yucca Mountain. Whether DOE conducts remediation activities at the NTS is outside the scope of this rulemaking. Nonetheless, EPA notes that the DOE DEIS provides an estimate of the impact of contamination at NTS in its DEIS. Assuming that the entire inventory of radionuclides resulting from nuclear weapons testing is available for transport (excluding the short-lived tritium), that transport would follow the route analyzed for releases from Yucca Mountain, and using conservative dilution factors, DOE estimates that the maximum potential dose from NTS during the 10,000 year compliance period will be roughly 0.2 mrem per year (DEIS, Section 8.3.2). DOE further estimates that the impacts from the GCD and LLW disposal facilities at NTS would be only a fraction of the potential impact from the transport of weapons-related radionuclides.

Issue FF: EPA should apply 40 CFR part 191 subpart A to aboveground storage.

1. We agree with EPA that the EnPA does not provide for the development of such standards, and that application of subpart A of 40 CFR part 191 would not be inappropriate. (240)

Issue GG: EPA should issue a new standard for aboveground storage at Yucca Mountain.

1. A revision of Subpart A of Part 197 to make it the only standard applicable to storage aboveground and in the repository is appropriate because the EnPA directs EPA to develop Yucca Mountain site-specific standards. . . DOE, believes, however, that the dose from storage aboveground should be limited to 25 mrem/year, consistent with NRC's 10 CFR Part 72 and proposed 10 CFR Part 63. Also, revising Subpart A of Part 197 to be the only applicable standard would avoid the need to utilize the older dose methodology of 40 CFR §191.03(a). (647)

Issue HH: NRC's proposed standard is appropriate for the operating period of the repository, when exposures are more likely.

1. We would expect that the more likely risk of radiation exposure at Yucca Mountain is in the "pre-closure" phase of the repository performance. This period covers the 23 year period of emplacing waste packages and performance monitoring for as few as 50 years or as many as 300 years before the repository is sealed. The standards applicable to that period are to be set forth in 10 CFR Part 63 currently pending at the NRC using 25 mrem annual dose limit as the radiation standard. (255)

Response to Issues FF through HH:

EPA considered establishing a new standard to cover the entirety of the management and storage operations at Yucca Mountain, as was suggested by one comment. This had the attractive feature of applying one standard, instead of two, to the management and storage activities in and around Yucca Mountain.

However, after considering the comments, the wording in § 801(a)(1) of the EnPA, and the impending rulemaking to amend subpart A of 40 CFR part 191, EPA decided to cover the surface management and storage activities within the Yucca Mountain site under 40 CFR part 191 and management and storage activities in the Yucca Mountain repository under 40 CFR part 197. However, the combined doses incurred by any individual in the general environment from these activities must not exceed 150 μ Sv (15 mrem) CEDE/yr. This will require the conversion of doses from the surface activities from the older dose system (under which the 40 CFR part 191 standards were developed) into the newer system to be able to combine the doses from the two areas of operation. There are established methods to do this (e.g., in the appendix to 40 CFR part 191) but we are leaving the methodology in this case to NRC's implementation process. We are continuing to develop a rulemaking to update the dose system used in subpart A of 40 CFR part 191. When that amendment is finished, the conversion for the activities subject to subpart A of 40 CFR part 191 will be unnecessary.

Regarding the likelihood of exposure during the operating period, EPA has not studied whether the probability of an exposure of a member of the public is greater in the pre- or post-closure periods because it is irrelevant to our setting a standard. Our authority under the EnPA is to set public health and safety standards that apply to releases from radioactive material "stored or disposed of in the repository". We have done that by setting the level of protection for both the pre- and post-disposal periods, found in subparts A and B, respectively. The commenter is also correct in stating that NRC has proposed an annual dose limit of 25 mrem that would apply during the pre-closure period. However, under the EnPA, NRC must issue a final 10 CFR part 63 (or amend its final rule) that is consistent with our standards in 40 CFR part 197.

Issue II: The Yucca Mountain repository should remain open so that waste can be retrieved.

1. The only way to ensure that no significant amounts of radioactive material escape the repository is to leave the facility permanently open and perpetually monitored, retaining sufficient handling and clean up facilities on site to retrieve leaking or questionable waste containers, repackage the waste and clean up spills before material can migrate to ground water. (488)
2. The ability to monitor and retrieve the waste, which offers future generations the ability to revisit the licensing decision tens of hundreds of years in the future before a final closure decision is made, is an additional measure of safety that should be taken into account. (554)

Issue JJ: EPA's standard should not be used for design or licensing of the repository.

1. The proposed EPA standard should be applied to the region around Yucca Mountain to provide a level of protection from radiological contaminants similar to that provided to the rest of the nation, however, the Department of Energy and Nuclear Regulatory Commission should not be allowed to utilize the proposed EPA standard for purposes of designing and licensing the repository. (489)

Response to Issues II through JJ:

The EnPA mandates that EPA promulgate public health and safety standards for protection of the public from releases of radioactive materials stored or disposed of in Yucca Mountain. The EnPA does not authorize EPA to direct DOE's operation of the repository. As long as DOE meets the EPA standard applicable to storage of SNF and HLW (i.e., prior to final closure of the facility), there are no constraints from EPA's perspective on how long DOE may keep the repository open to allow waste retrievability. EPA also has no authority to forbid DOE and NRC from using its standard to guide design and licensing of the repository. In fact, it would be impractical to do so, as NRC must be satisfied that the repository will meet all applicable standards, including EPA's, prior to licensing.

There is, however, the consideration that leaving the repository open for long periods after all waste has been emplaced would present an undue burden on future generations. A fundamental tenet of radioactive waste management is that those responsible for generating the waste must bear the burden of managing it. Leaving it for future generations would put the onus on those who received no benefit from the processes that led to the waste being generated. This principle has been expressed by Congress ("...appropriate precautions must be taken to ensure that such waste and spent fuel do not adversely affect the public health and safety and the environment for this and future generations," NWPA, 1982) and by the IAEA ("Radioactive waste shall be managed in such a way that will not impose undue burdens on future generations," Principles of Radioactive Waste Management, IAEA Safety Series No. 111-F, 1995, Docket A-95-12, Item V-A-10).

Issue KK: The status of water rights may not be as EPA stated.

1. While it is true, as stated in the first paragraph, that "the Yucca Mountain site is on several federally controlled areas of land," it is unclear that the "U.S. government is the senior appropriator," although it holds water rights. If this is true, why has the DOE had to seek and obtain water rights from the Nevada State Engineer through allocation hearings? (588)

Response to Issue KK:

Whether or not DOE is the "senior appropriator" of water rights makes no difference to EPA's standard. Nonetheless, the situation appears less clear-cut than characterized in the proposal.

Issue LL: Request for extension of the public comment period.

1. [T]he Federal Register notice for this public hearing only came out on October 1st, and I know that a number of organizations who would otherwise be here are very busy right now. . .an extension of the comment period would be helpful for all of our organizations to do the best job that we can. (11)
2. I think that most of the public has been unaware of, well, perhaps not of the issuance of the draft standard, but of your schedule for hearings and the deadline for comment, I would ask right now that EPA extend the comment period so that those throughout the nation, not just here in Washington, and Las Vegas, but also throughout the entire nation have an opportunity for comment. (27)
3. [W]e also request an extension of the time to submit comments which will ensure that the broad interests of the Western Shoshone Nation are included and considered. (112)
4. We note that submission of comments has been made more difficult due to inability to find a statement of the correct electronic mailing address in either 64 FR 46976 or 53304. We suggest that EPA should have and still should extend its deadline to account for this apparent omission of information. (351)

Response to Issue LL:

EPA's proposed standards for Yucca Mountain were published on August 27, 1999. This began 90-days of public comment on the proposed standard. Notification of the availability of the proposed standards and the opportunity to comment was published in the Federal Register, on the EPA's Yucca Mountain Home Page and on EPA's Yucca Mountain Information Line. EPA believes that the 90-day comment period was sufficient and sufficient notification of the opportunity to comment was given. EPA has received comments on the proposed standard after the close of the comment period on November 26, 1999. These comments were identified as "late" and placed in the official Yucca Mountain docket (Docket A-95-12). In this Response to Comments document, EPA has addressed all comments that were received during the comment period and has made every effort to also respond to any "late" comments.

In response to comment #351, the proposed standard stated that two copies of comments were to be sent to EPA's Central Air Docket (64 FR 46976). No electronic address was given for the submission of comments.

Issue MM: EPA should consider all comments equally.

1. And I hope that the public comment that you receive both in written and in oral testimony is weighed equally with any other testimony you may receive from government agencies, industry groups or OMB, NRC, whatever. I think this is a public project. It's public health and safety. It's public money. The public needs to be heard, and they need to have their concerns weighed in a

way that is equal to other comments that are received. (139)

Response to Issue MM:

EPA does consider all comments received on this proposed standard and other standards equally. All written comments and comments received during public hearings, regardless of who has said them, receive consideration. This Response to Comments document addresses all the comments that were received that are relevant to this rulemaking.

Issue NN: EPA needs to improve the quality of the supporting documentation for the proposed rule.

1. We find the 36 page discourse of Supplementary Information published with the Proposed Rule to be difficult for the layperson to comprehend. It does not surprise us to learn that there was very little attendance at the public hearings.(252)
2. EPA needs to do a much better job of describing the various dimensions of this rulemaking and how they relate to one another. Full transparency demands that EPA distinguish between, for example, simplifying assumptions required because certain data are not available, limits imposed by existing models, and decisions EPA is making as a matter of general policy. (437)

Response to Issue NN:

EPA has tried to make the materials for this standard as easy to understand to as many people as possible. For example, we have structured the standard into a question and answer format. We do realize, however, that many of the issues addressed in this standard are highly technical in nature. Any further simplification of these standards could result in unintended interpretations of the standards. For this reason, EPA has developed other documents that are aimed at providing an overview of the issues at Yucca Mountain, EPA's role and process and the role of other agencies.

EPA has also attempted to provide information on our work for Yucca Mountain through many different venues. EPA maintains a web page from which both technical and non-technical documents can be downloaded. We also maintain an information line from which the public can receive updates on the project and request additional information or assistance.

Issue OO: Communication about the proposed standard and the comment process was inadequate and inappropriate.

1. We are completely locked out. We have no internet. We have no e-mail. We have no Federal Register, as you well know, and I've been telling you for years. We are deprived, but we don't have to be deprived. (45)

2. The Newe people, Western Shoshone people, practice an ongoing oral tradition of communication. We have a sophisticated social communication process which do not respond well with US written hearing processes. This includes notification of meetings and proposed radiation standards. (107)

Response to Issue OO:

EPA has attempted to provide alternative methods for communication on work in setting radiation protection standards for Yucca Mountain. EPA recognizes the challenges to communication that may affect the communities surrounding Yucca Mountain. For this reason, EPA has tried to offer varying forms of communication. For example, in addition to the Federal Register and EPA's web site, we have established a toll-free information line. Through this number, a caller can receive updates on our activities and can request information or assistance. For activities like public hearings, EPA advertised in local newspapers and on local television and radio stations, in addition to the Federal Register and the information line.

Issue PP: What costs are associated with EPA standard?

1. Before finalizing this rule, EPA should evaluate the costs and benefits of a 15 mrem versus 25 mrem standard. Lincoln County and the City of Caliente are concerned that EPA will require a standard which carries with it extraordinary costs of compliance while affording little if any tangible public health benefits. (520)

2. Without a cost-benefit analysis this question cannot be answered. What additional public health benefit will result from a 15 mrem versus 25 mrem standard? How much will it cost to attain this incremental increase in public health protection? If the cost of compliance with a 15 mrem standard is high, could Nuclear Waste Funds be spent in other risk minimization activities resulting in greater public health benefit (i.e., reduction of transportation risk). (523)

3. The statement that, "These Agency programs have demonstrated that such protection is scientifically achievable," does not address the relevance of these programs to Yucca Mountain. What is the added level of protection [from a separate ground-water standard] and at what cost? Why would not an appropriate, single, all-pathways standard for Yucca Mountain achieve this goal? (584)

4. The August 1999 economic analysis [that accompanied the proposed rule] seems to be of limited value, because of the lack of cost information on the repository design, which is still evolving, as well as other factors that prevent EPA from providing detailed cost estimates related to the Proposed Rule. Instead, the analysis is qualitative. (796)

5. We believe there should be a clarification of the worst case impact described in page 14 [of the draft economic impact evaluation]. You indicate that if DOE is unable to meet the proposed radiation standards at Yucca Mountain that re-siting may be required and "the costs would be borne by the commercial generators of spent nuclear fuel and the Federal Government." With the

profound political difficulties siting the proposed repository in the site already selected as best suited for a repository, it is hard to imagine re-siting elsewhere at less suitable sites if Yucca Mountain fails to meet the standards. We agree that re-siting is unlikely, but costs for spent nuclear fuel storage and disposal may be paid to the Federal Government by the commercial generators, but those costs are ultimately borne - over \$16 billion to date - by the Nation's electric ratepayers. The prospect of them being asked to "re-incur" over two billion dollars should a new site be required would be unfair. (797)

6. We agree that the benefit of eliminating regulatory uncertainty by issuing a standard is tangible, even if not presently measurable. The last sentence on page 13 [of the draft economic impact evaluation] recognizes that the costs of maintaining spent fuel at present reactor sites continues until a repository is built. Those costs include not just the expense of additional, unanticipated on-site storage capacity but the settlement of outstanding claims for damages by many, if not eventually all, of the commercial generators. Although no basis for the estimate of that liability was given, one of the Congressmen in the floor debate of S. 1287 estimated those damages could be \$60-80 billion. Even if the settlement costs are one-tenth of that amount, it is a large cost that could have been avoided had the Federal Government fulfilled its legal and contractual obligation in 1998. (798)

Response to PP.1:

The incremental costs for the IPS contained within 40 CFR part 197 have been addressed by EPA as part of its EIA performed for this rulemaking. Briefly, there do not appear to be any incremental costs attributable to EPA's standard as a result of either a 15 or 25 mrem IPS. This assertion can be made on the basis of DOE's performance assessments of the Yucca Mountain disposal system, which show that it, as currently designed, is capable of meeting a 15-mrem level of a standard by a very large margin [see Chapters 3, 4, and 7 of the EIA for Yucca Mountain (Docket A-95-12, Item V-B-2) for a more detailed discussion of this ~~And~~ impact@determination].

Response to PP.2:

A 15-mrem IPS provides a marginal increase in health protection for the RMEI. The protection of the RMEI is an indirect method of providing protection to the public at large. EPA's most recent analyses, embodied in the EIA for Yucca Mountain (Docket A-95-12, Item V-B-2), show that this incremental increase is attainable at no additional cost due to the performance of the Yucca Mountain disposal system, as it is currently designed. Therefore, no additional Nuclear Waste Funds are expended in providing this level of protection.

Response to PP.3:

As described in EPA's most recent analysis of the cost impact of 40 CFR part 197 on the Yucca Mountain disposal system, "Evaluation of Potential Economic Impacts of 40 CFR 197" (Docket A-95-12, Item V-B-2), the level of protection offered by the individual and ground-water standards does not result in an increase in the disposal system's development cost.

A single, all-pathways standard for Yucca Mountain does not achieve the same goal as separate individual and ground-water standards because EPA views the protection of the ground-water resource as a goal separate and apart from the protection of the individual. The protection of ground water is entwined with the issues of: (1) protection of resources for future generations; (2) pollution prevention; and (3) consistency with the SDWA. As such, protection of ground water calls for a separate standard to achieve these goals.

Response to PP.4 through PP.6:

EPA addressed the fact that our draft economic impact evaluation was constrained in its conclusions by both the methodology and available information, by extensively revising it for the final rule. Using information from the most recently available DOE performance assessments, coupled with a review of Yucca Mountain design history, these revisions allowed the case to be made that our 40 CFR part 197 standards (1) have had no influence on the current repository design and (2) have imposed no additional costs on the Yucca Mountain Program. Implicit in this analysis is the argument that our rulemaking will neither result in a re-siting of the repository nor delay waste acceptance (see the Final EIA for 40 CFR 197, Docket A-95-12, Item V-B-2).

In addition, we note that comment 797 misconstrues the current status of the SNF/HLW repository program. The Yucca Mountain site has not been "already selected as best suited for a repository." In fact, it will never be known whether Yucca Mountain is the "best" site from a technical standpoint, simply because other candidate sites were never studied as extensively. Therefore, any conclusions regarding Yucca Mountain's suitability will be based on its ability to satisfy certain performance objectives, not on whether it is "better" than other sites. As a result, while DOE has determined that the Yucca Mountain site is a viable alternative for location of a SNF/HLW repository (Viability Assessment, Docket A-95-12, Item V-A-5), DOE has not yet determined that Yucca Mountain is well-suited, and will not make a final determination as to whether it is "best suited," as the location for such a repository. DOE is currently characterizing the Yucca Mountain site to determine if it should be recommended as the site for disposal of SNF/HLW. Such determination is expected in 2001.

Issue QQ: The goal of the repository should not be the delay of radionuclide releases: it should be the prevention of such releases.

1. The definition wrongly sets the goal of the geologic repository to be a delay of release of radionuclides rather than waste isolation, which should include a controlled rate of radionuclide release and transport beginning at some time in the future. (125, 126, 504)
2. The definitions of "disposal" and "barrier" inappropriately skew the basic notion of geologic disposal through the use of multiple barriers, not just the natural geology, to accommodate Yucca Mountain's known inadequacy to isolate waste from the biosphere. This is a fundamental flaw in the proposal. (118, 124, 126, 144, 374)

3. Defining successful disposal by an arbitrary reasonableness standard is an effort to enable licensing of a dump, not a fulfillment of the goal of geologic isolation. (207)

Response to Issue QQ 1-2:

It may be impossible to locate and design a deep geologic repository that provides an absolute guarantee of complete and permanent isolation of the disposed wastes from the environment in perpetuity, solely on the basis of the geologic features of the repository. EPA's definition recognizes this fact, and provides for the maximum protection of public health and the environment. Similarly, our generally applicable regulations at 191.14(d) require utilization of engineered barriers and do not assume that the geologic (natural) barrier at a repository site must of necessity provide total containment of radionuclides for unlimited time periods. Thus, we believe that it is appropriate, under the circumstances present at Yucca Mountain, for our standard to neither encourage nor discourage DOE from relying in its repository design on both engineered and natural barriers. Moreover, we did not develop our standard based on DOE's design for the repository, just as DOE has not based its repository design on our standard. For these reasons, we see no reason to amend our definition to preclude DOE from taking advantage of the available engineered barriers, especially because DOE expects those barriers to provide waste containment beyond that which Yucca Mountain's natural barriers alone could provide. Moreover, precluding DOE from taking advantage of available engineered barriers would have the perverse effect of diminishing the protectiveness of the repository. This would not constitute good regulatory policy. We believe that the basic notion of geologic disposal is not skewed by the incorporation of engineered barriers into the disposal system, but rather that the combination of optimized engineered and natural barriers is a prudent and technically sound approach to the permanent disposal of these wastes.

EPA's definition of barrier is substantially similar to the definition of "barrier" in our generally applicable standards (see 40 CFR § 191.12). The minor differences between the definitions in the two regulations are the result of the regulations' different roles. Part 191 is a generally applicable standard that can be used at any site where disposal of these wastes occurs. Part 197, on the other hand, is site-specific: it applies solely to the planned repository at Yucca Mountain. Thus, the definition in 40 CFR part 197 incorporates additional elements to account for the specific characteristics of the Yucca Mountain site.

Response to Issue QQ.3

EPA disagrees that its standards that require DOE to meet a "reasonable expectation" for the repository's performance are "arbitrary." First, this standard already is present in our generally applicable standards for disposal of HLW, SNF, and TRU radioactive waste [40 CFR § 191.13(b)]. Thus, applying a "reasonable expectation" standard to Yucca Mountain maintains consistency with the standards applicable to the only other deep geologic repository in the United States for the disposal of these wastes. Second, "reasonable expectation" is a standard that is better able to account for the extreme uncertainties that exist at a facility such as Yucca Mountain. The NRC uses "reasonable assurance" in its licensing process for nuclear power

plants. These licenses have a typical duration of 40 years. “Reasonable assurance” requires a much higher burden of proof than does “reasonable expectation.” Because of the “reasonable assurance” standard’s high burden of proof and because of the extremely long compliance time frames at issue at Yucca Mountain, we believe that it would be extraordinarily difficult, if not impossible, for the NRC to implement successfully a “reasonable assurance” standard. On the other hand, a “reasonable expectation” appropriately accounts for the great uncertainties associated with the extremely long time periods involved in regulating a facility such as Yucca Mountain. We believe that the NRC would have significantly less difficulty in implementing such a standard at Yucca Mountain. See Section 2 of this document for more extensive discussion of this issue.

Issue RR: Eliminate “sealing” and/or “backfilling” from the definition of “disposal.”

1. Requiring backfilling and sealing may or would actually impede, rather than enhance, the safe isolation of nuclear waste. (86, 310, 589)
2. The terminology in the definition suggests that disposal begins when the repository is sealed and backfilled. This situation may not occur entirely under different ventilated or “cool” repository designs. Use of backfill is not a certainty, but a decision to be made. (503, 585)
3. There has been no demonstration yet of the benefits (if any) of backfill in protecting public health and safety. (656)
4. Comments such as EPA expects the engineered barrier system to be “backfill in the spaces between the waste packages and adjacent rock” is better left for the NRC and others to contemplate. (346, 589)

Response to Issue RR:

Several commenters requested that EPA remove the requirement that disposal include backfilling the excavated drifts and tunnels in the repository. In response to these comments, we amended the definition of “disposal” in the final rule to eliminate the backfilling requirement. We recognize that specifying that DOE must backfill the repository, essentially would force DOE to adopt a particular subsystem design feature. The NAS, in its report, recommended that we avoid specifying subsystem design features.

EPA believes that it is necessary and appropriate, however, for DOE to seal the repository after it reaches its maximum waste capacity; therefore, we retained this requirement in the final rule. Sealing the repository will help minimize direct releases to the air. It also will help prevent human intrusion at the repository.

Issue SS: The definition of “aquifer” specifically should exclude perched water bodies. Perched water will be of little value to future residents because there is little, if any, perched water in the area and there is abundant water in the saturated zone that is easier and cheaper to access. (250)

Response to Issue SS:

EPA does not agree that the definition of aquifer should exclude perched water bodies. Should a body of perched water, of sufficient size to allow withdrawal of the yearly representative volume, exist at Yucca Mountain, it is appropriate and logical that the rule should cover this water. On the other hand, should a body of perched water at Yucca Mountain not meet the representative volume criteria, the regulatory language of Section 197.12 would de facto exclude it from coverage under the rule’s provisions. These same comments apply to the commenter’s suggestions that we make similar changes to the definition of “ground water” in the same section of 40 CFR part 197.

Issue TT: In the definition of “barrier:” use “site” rather than “repository” because if EPA uses “repository,” then DOE cannot claim some geological features as barriers. (251)

Response to Comment TT:

EPA developed its environmental protection standards independently of DOE’s repository design. Further, we believe that it is essential to minimize, to the extent practicable, the amount of land dedicated to use as natural barriers. Extending the definition of “barrier” to encompass the entire Yucca Mountain site goes beyond our understanding of geologic disposal; namely, that the repository itself, and the immediately surrounding area where necessary, should serve as the primary natural barrier(s). Again, we wish to minimize the area contaminated by releases from the repository. Limiting the use of natural barriers to the features of the repository itself, and not the surrounding site, will help accomplish this goal. DOE’s current design for the repository envisions using both natural and engineered barriers to limit or prevent releases of radioactive material from the Yucca Mountain repository. We do not believe that it is appropriate for us to link this (or any) aspect of our standard to DOE’s planned design for the repository. Thus, while we sympathize with and understand the commenter’s concerns, we see no need to amend the definition as requested.

Issue UU: DOE supports NAS’s recommendations regarding ALARA, and supports EPA’s proposal not to incorporate ALARA into its standards. (653)

Response to Issue UU:

EPA’s final position is not to include ALARA provisions in its final standards.

Issue VV: EPA should consult with Indian Tribes about their traditional and customary uses of lands in the Yucca Mountain area, and the RMEI characteristics should consider such Tribal uses.

1. Although the EPA has indicated that there are no Indian reservations located within the Yucca Mountain area or its immediate vicinity, the Paiute and Shoshone Tribes use the area for traditional and customary purposes including traditional gathering. It is the Tribes' contention that these traditional and customary Tribal uses need to be researched in cooperation with the Tribes and incorporated into the formula upon which the draft standards are based. For example, the location and the qualities of EPA's current RMEI, as discussed in the proposed rule, do not consider traditional and customary Tribal uses in the area. There may be traditional and customary uses of natural springs, wildlife, and vegetation, in certain locations, which would significantly impact the RMEI calculations. Additionally, in light of the potential for ground-water contamination and the movement of that ground water, the location of the RMEI may need to be expanded. (790)
2. EPA's radiation experts were not sufficiently knowledgeable about the traditional and customary Tribal uses of the areas resources to properly incorporate them into the formula upon which the draft standards are based. Thus, the proposed standards may not be based upon accurate assumptions. Certain Tribes contend that their lifestyle, including the types of plants and animals they consume, doesn't provide as much shielding and protection and has different exposure pathways than the models used by DOE in its offsite radiation exposure project studies leading to increased risk. Depending on the traditional and customary Tribal uses and the locations of those uses, the assumptions related to the RMEI may need to be totally revised. (791)
3. EPA has a duty to consult with those Tribes whose aboriginal homelands will be potentially impacted by the proposed Yucca Mountain repository when developing its risk assessment model, and identifying potential exposure pathways. (790)
4. The Tribes need to be provided an opportunity to play a direct role in preparing the risk assessment and identifying the exposure pathways. (794)
5. EPA should engage the potentially-affected Tribes directly to develop a Tribally-specific risk assessment model that can be compared directly with the current RMEI model in order to check its accuracy. (795)
6. Full government-to-government consultation between the Timbisha Shoshone Tribe and the U.S. EPA did not occur. (784)

Response to Issue VV:

Consistent with the Federal government's trust responsibility to Federally-recognized Indian Tribes, it is EPA's policy to operate within a government-to-government relationship with such Tribes and to consult with them regarding EPA actions that affect their interests. EPA agrees,

therefore, that it was appropriate for the Agency to consult with those Federally-recognized Tribes whose interests, including their traditional and customary uses of their aboriginal homelands, may be affected by EPA's development of its risk assessment model and identification of potential exposure pathways in establishing radiation protection standards for the proposed Yucca Mountain repository. Consistent with EPA's Indian policy, in 1999, following publication of the proposed rule, EPA began its process of consultation and outreach with potentially affected Tribes.

In mid-October 1999, EPA staff hosted a conference call with representatives of several Tribes located in and around Nevada. Two weeks later, on October 29, 1999, EPA met with the Nevada Indian Tribes in San Francisco. During this meeting EPA representatives led a discussion about EPA's role in the process, requested comments from the participants, and answered questions. Finally, EPA staff held a workshop at the Inter-Tribal Council of Nevada Annual Conference on November 22, 1999. EPA staff gave a detailed presentation on the Yucca Mountain Project and EPA's role in the process. Additional comments from the Tribes were requested at this time. Many potentially affected Tribes have submitted comments to the Agency, and some have passed resolutions in response to the proposed rule. The culmination of these activities has provided EPA with valuable information regarding the Tribes' perspective on the proposed radiation protection standard for Yucca Mountain. EPA has considered the Tribal comments provided to the Agency in the final rule and responses to comments from Tribes are contained in this preamble and in the Response to Comment document.

After considering the description of Tribal land uses in the area of Yucca Mountain, EPA has concluded that the rural-residential RMEI is fully protective of Tribal members and the resources they use for four reasons. First, the Tribal use of natural springs is apparently occurring in the vicinity of Ash Meadows. EPA is aware of no other area downgradient from Yucca Mountain where water discharges in natural springs, with the possible exception of springs in the more distant Death Valley. These natural springs are likely fed by the "carbonate" aquifer, which is beneath the "alluvial" aquifer being used in the town of Amargosa Valley (including at Lathrop Wells) now, and which will likely be used in the future. The question of whether the carbonate aquifer would be contaminated by releases from the Yucca Mountain disposal system has not been resolved by DOE. The available data indicate that although it is likely that the alluvial aquifer would be contaminated by releases from the potential Yucca Mountain repository, flow is generally upward from the carbonate aquifer into the overlying aquifers, suggesting that there is no potential for radionuclides to move downward into the carbonate system. If downward movement were to occur, however, radionuclide concentrations would be significantly diluted in the larger carbonate flow system. As a result, springs fed from the carbonate aquifer would have lower contamination levels than would wells at the Lathrop Wells location, which tap aquifers closer to, and more directly affected by, the source of potential contamination. Thus, Tribal users of natural springs fed by the carbonate aquifer would experience lower contamination levels than users of the alluvial aquifer at Lathrop Wells upon whom the RMEI was based. A more extensive discussion of the aquifer systems and geology in the Yucca Mountain area may be found in Chapters 7 and 8 of the BID.

Second, the Tribal use of wildlife and non-irrigated vegetation should not contribute significantly to total individual dose estimates. Gaseous releases from the repository are not a significant contributor to individual doses (NAS Report, p. 59) through inhalation or rainfall, and should contribute less to contamination of wildlife and non-irrigated vegetation than the use of contaminated well water for raising crops and animals for food consumption. We believe our requirement that DOE and NRC base food ingestion patterns on current patterns for the agricultural area directly downgradient from the repository is a more conservative requirement.

Third, the dose incurred by the RMEI is calculated at a location closer to the disposal system than the Ash Meadows area (approximately 18 km versus 30 km). The RMEI would receive a higher dose from ground-water consumption than would an individual at Ash Meadows, even if the carbonate aquifer could be contaminated by repository releases, for the reasons mentioned above.

Fourth, the RMEI is assumed to be a full-time resident continually exposed to radiation coming from the disposal system. It appears that the Tribal uses are intermittent and involve resources which are less likely to be contaminated, resulting in lower doses than those to the RMEI.

Issue WW: EPA should lower the proposed standard to 5 millirems. This standard more accurately takes into consideration the affected Tribes' traditional and cultural lifestyles.
(316, 757, 783)

Response to Issue WW:

EPA has discussed extensively in the preamble to the final rule and in Section 4 of this Response to Comments document its basis for adopting the standard of 15 millirems. As discussed in the response to comments above, this standard is protective of Tribal members, taking into consideration their traditional and cultural lifestyles and uses of lands in the Yucca Mountain area.

Issue XX: The effects of radiation on plant and animal life that are used by Tribal people have not been included.

1. Members of the Elko Band have in the past gathered and hunted, and presently gather and hunt, in areas directly affected by the proposed repository. The effects of radiation on this plant and animal life have not been included in the studies EPA relied upon in setting the proposed standard. (755)

Response to Issue XX:

As discussed above in response to separate comments, the Tribal use of wildlife and non-irrigated vegetation should not contribute significantly to total individual dose estimates. Gaseous releases from the repository are not a significant contributor to individual doses (NAS Report, p. 59) through inhalation or rainfall, and should contribute less to contamination of wildlife and non-irrigated vegetation than the use of contaminated well water for raising crops and animals for food consumption. We believe our requirement that DOE and NRC base food ingestion patterns on

current patterns for the agricultural area directly downgradient from the repository is a more conservative requirement.

Issue YY: The United States has no lawful trust responsibility.

1. There is no lawful authority for the United States to exercise a so-called trust responsibility on behalf of the Western Shoshone government. That role is reserved under the inherent sovereign authority of the Western Shoshone National Council. (108)

Response to Issue YY:

The Federal government has a trust responsibility to Federally-recognized Indian Tribes that arises from Indian treaties, statutes, executive orders, and the historical relations between the United States and Indian Tribes. Like other Federal agencies, EPA must act in accordance with the trust responsibility when taking actions that affect Tribes. EPA's actions in accordance with the trust responsibility in this matter do not deprive any Tribe of any inherent sovereign authority.

Issue ZZ: The Treaty of Ruby Valley takes precedence over United States law.

1. The Treaty of Ruby Valley, the Northwest Territorial Ordinance of 1787, the United States Constitution, Article VI, Paragraph II, the Treaty of Guadeloupe Hidalgo of 1848, and the Act of Congress Organizing the Territory of Nevada in 1861 provide certain protections for the Western Shoshone people which preempts the application of United States law regulating nuclear material transportation, use, storage, or disposal except as authorized under the Treaty of Ruby Valley. (110)

Response to Issue ZZ:

EPA believes that we have the authority to regulate radiation protection standards for Yucca Mountain, NV. Congress specifically authorized and directed EPA to develop such site-specific standards for Yucca Mountain in the EnPA. EPA respects the Tribes traditional interests in the area. However, EPA does not believe that the Tribes have regulatory authority to set radiation protection standards in the Yucca Mountain area.

Issue AAA: EPA has a duty to protect the health, welfare, and the environment of the Western Shoshone people. (113)

Response to Issue AAA:

To the extent that this comment is referring to EPA's statutory obligation to protect the health, welfare, and the environment of the Western Shoshone people, EPA agrees. In addition, as discussed elsewhere, EPA must act in accordance with the Federal government's trust responsibility to Federally-recognized Indian Tribes and consult with such Tribes and consider their views regarding EPA actions that affect their interests. EPA's site-specific radiation

protection standards for Yucca Mountain protect public health and the environment from harmful exposure to the radioactive waste that would be stored and disposed in the proposed underground geologic repository. To ensure this protection, EPA's standards address all environmental pathways: air, ground water, food, and soil. The standards are protective of the closest residents to the repository to 15 millirem per year, or a risk of no greater than a 3 in 10,000 chance of contracting a fatal cancer. This level is within the Agency's acceptable risk range for environmental pollutants. The closest residents to the repository in the path of any potential releases are at Lathrop Wells, NV, which is 20 kilometers (about 12 miles) from the site. EPA's final standards require DOE to calculate doses incurred by the RMEI at a distance no farther than about 18 km from the repository. The potential risk for those at greater distances would be even less.

Issue BBB: EPA should investigate U.S. government trespassing and environmental justice infringements.

1. Racial discrimination is believed to play an important role in selecting Newe Sogobia for the proposed nuclear waste repository site from the nine originally proposed sites. The Tribe expects the U.S. EPA to investigate the processes by which the site selection and standards are proposed to uncover institutional racism which the Western Shoshone Nation Council believes results in trespassing by the DOE, the BLM, the U.S. Air Force, and the State of Nevada, and other foreigners who seek to impair, usurp or otherwise destroy the rights and authority of the Western Shoshone Nation. (111)

Response to Issue BBB:

The EPA was not involved in, and has no authority to oversee or investigate, the process to identify a potential repository site for SNF and other HLW. EPA's only regulatory authority for Yucca Mountain comes from the Energy Policy Act of 1992, which directs EPA to set radiation protection standards for Yucca Mountain. EPA has set these standards to protect human health and the environment, including members of the Western Shoshone Nation.